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B65F 1/10(21) Application number: **11288733**(71) Applicant: **SAN ROLL:KK**(22) Date of filing: **08.10.99**(72) Inventor: **NAKANISHI AKIRA**(54) **PAPER DIAPER VACUUM PACKING METHOD**

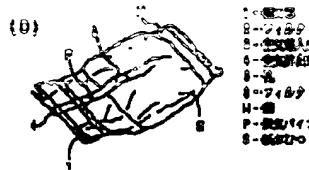
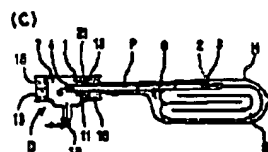
(57) Abstract:

PROBLEM TO BE SOLVED: To provide a paper diaper vacuum packing method which can contribute to the problems of an aging society and environmental pollution because with which the number of waste bags required is small and the amount of waste to be collected is lowered owing to less bulkiness, the generation of a offensive smell or bacteria from a waste bag kept in a house or at a waste collection station is prevented, and which is clean and hygienic and enabling a caretaker to take care with less worry and burden.

SOLUTION: This relates to a method for vacuum packing a paper diaper S. The used paper diaper S is stored in a bag H made of a material not air-permeable. After the air in the bag H is discharged for making the bag vacuum, the bag H in a vacuum condition is coated. In the inside of the bag H, a roughly tube shape cleaning pipe P is either mounted or inserted from the neighborhood of the opening 1 to the center of the bag H, and one end of the pipe P is an air introduction inlet 3 covered with a filter 2 and the other end is an air discharge outlet 4 communicating with the outside of the bag

H. In the center of the pipe P, a hole 5 covered with a filter 6 is provided, and the discharge of the air in the bag H is done through the pipe P. The neighborhood of the opening 1 of the bag H in a vacuum condition is welded with the pipe P.

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1-Opening
2-Filter
3-Air introduction inlet
4-Air discharge outlet
5-Hole
6-Filter
H-Bag
P-Pipe
S-Paper diaper

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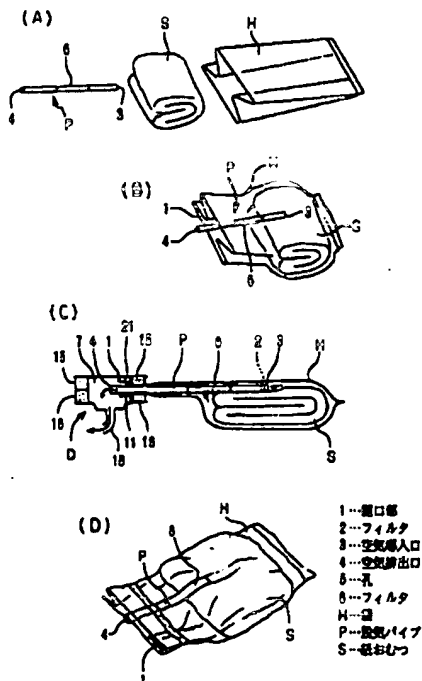
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(54) 【発明の名称】 紙おむつの真空パック方法

(57) 【要約】

【課題】 嵩張りをなくしてごみ袋の数量を少なくするとともに、ごみの回収量を低減し、家庭内あるいはごみの収集場所に保管されたごみ袋からの異臭や菌の発生を防止し、清潔かつ衛生的で、介護者の負担を軽くして安心して介護できるようにし、これからの高齢社会および環境汚染の問題に貢献できる紙おむつの真空パック方法を提供する。

【解決手段】 非通気性の材料からなる袋H内に使用後の紙おむつSを収納し、前記袋H内の空気を排出して真空状態とした後、真空状態となった袋Hを密封する紙おむつSの真空パック方法であって、前記袋Hの内側には、袋Hの開口部1付近から中央部に向かってほぼ筒状の脱気パイプPが装着または挿入され、この脱気パイプPの一端はフィルタ2に覆われた空気導入口3に、他端は前記袋Hの外側へ通じる空気排出口4とされるとともに、脱気パイプPの中央部には、フィルタ6に覆われた孔5が設けられており、袋H内の空気の排出は、前記脱気パイプPを介して行われ、真空状態となった袋Hの開口部1付近を脱気パイプPとともに溶着する。



【特許請求の範囲】

【請求項1】 非通気性の材料からなる袋内に使用後の紙おむつを収納し、前記袋内の空気を排出して真空状態とした後、真空状態となった袋を密閉する紙おむつの真空パック方法であって、前記袋の内側には、袋の開口部付近から中央部に向かってほぼ筒状の脱気パイプが装着または挿入され、この脱気パイプの一端はフィルタに覆われた空気導入口に、他端は前記袋の外側へと通じる空気排出口とされるとともに、脱気パイプの中央部には、フィルタに覆われた孔が設けられており、袋内の空気の排出は、前記脱気パイプを介して行われ、真空状態となった袋の開口部付近を脱気パイプとともに溶着することとを特徴とする紙おむつの真空パック方法。

【請求項2】 密閉可能なチャンバーと、このチャンバー内の空気を排気する排気手段と、前記袋の開口部付近を熱溶着する溶着手段とを有する装置によって、前記袋を真空パックする請求項1に記載の紙おむつの真空パック方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、使用後の紙おむつを真空パックする紙おむつの真空パック方法に関するものである。

【0002】

【従来の技術】たとえば、一般家庭あるいは病院において、幼児、身体障害者、病気や事故などによる介護が必要な成人および高齢者などの使用後の紙おむつは、従来、そのままごみ袋に捨てられている。そして、この紙おむつには、汚物を吸収する分厚い吸収体が設けられており、しかも、使用後の紙おむつの体積は、使用前に比して約2倍位に膨れるのが通常である。

【0003】また、通常規定されたごみの収集日は週2回程度であり、ごみの収集日まで（3、5日間）に溜まる紙おむつの量は、成人および高齢者の場合、紙おむつを一人当たり1日に5～6回取り換えるため、20袋以上となる。これは、ごみ袋で2、5袋程度となる。

【0004】さらに、家庭内において、紙おむつが収納されたごみ袋をごみの収集日まで保管すると、放置されたごみ袋から異臭や菌が発生しやすく、介護者などは、紙おむつが収納されたごみ袋の保管場所に苦慮しているのが現状である。特に、国は在宅介護を奨励しているため、今後家庭内での紙おむつの処理は大きな問題になる。

【0005】

【発明が解決しようとする課題】上述したように、前記紙おむつは、分厚い吸収体に加え、使用後の紙おむつの厚さは使用前に比して約2倍程度に膨らみ、特に成人および高齢者の場合、1日に取り換える紙おむつの量が多いため、ごみの収集日まで溜まる使用後の紙おむつを保管するスペースを広く設ける必要があった。また、使

用後の紙おむつの量が多くなることに伴って、ごみ袋の数量も多くなり、ひいてはごみの回収量も増大するという問題が生じた。

【0006】また、家庭内において、紙おむつが収納されたごみ袋をごみの収集日まで保管した場合およびごみの収集場所に放置した場合、ごみ袋から異臭や菌が発生しやすく、不潔で不衛生である。このように、使用後の紙おむつの処理は、在宅介護されている方には大きな問題であり、これからの高齢社会および環境汚染の新たな課題とも言える。

【0007】本発明は上述の事柄に留意してなされたもので、その目的は、嵩張りをなくしてごみ袋の数量を少なくするとともに、ごみの回収量を低減し、家庭内あるいはごみの収集場所に保管されたごみ袋からの異臭や菌の発生を防止し、清潔かつ衛生的で、介護者の負担を軽くして安心して介護できるようにし、これからの高齢社会および環境汚染の問題に貢献できる紙おむつの真空パック方法を提供することである。

【0008】

【課題を解決するための手段】上記目的を達成するために、本発明の紙おむつの真空パック方法は、非通気性の材料からなる袋内に使用後の紙おむつを収納し、前記袋内の空気を排出して真空状態とした後、真空状態となった袋を密閉する紙おむつの真空パック方法であって、前記袋の内側には、袋の開口部付近から中央部に向かってほぼ筒状の脱気パイプが装着または挿入され、この脱気パイプの一端はフィルタに覆われた空気導入口に、他端は前記袋の外側へと通じる空気排出口とされるとともに、脱気パイプの中央部には、フィルタに覆われた孔が設けられており、袋内の空気の排出は、前記脱気パイプを介して行われ、真空状態となった袋の開口部付近を脱気パイプとともに溶着する（請求項1）。

【0009】また、密閉可能なチャンバーと、このチャンバー内の空気を排気する排気手段と、前記袋の開口部付近を熱溶着する溶着手段とを有する装置によって、前記袋を真空パックするとしてもよい（請求項2）。

【0010】上記の構成により、嵩張りをなくしてごみ袋の数量を少なくするとともに、ごみの回収量を低減し、家庭内あるいはごみの収集場所に保管されたごみ袋からの異臭や菌の発生を防止し、清潔かつ衛生的で、介護者の負担を軽くして安心して介護できるようにし、これからの高齢社会および環境汚染の問題に貢献できる紙おむつの真空パック方法を提供することができる。

【0011】

【発明の実施の形態】以下、本発明の実施例を、図を参照しながら説明する。図1および図2は、本発明の第一実施例に係る紙おむつの真空パック方法を実施するための袋Hと装置Dの構成を概略的に示す縦断面図および要部拡大斜視図である。本発明の紙おむつ用真空パック方法は、新規なノズル（ストロー）吸引方式を用いた衛生

密閉処理法であり、より詳しくは、使用済の紙おむつSを袋Hに収納し、装置Dによって袋Hを真空バックするためのものである。

【0012】前記袋Hは、たとえば薄い樹脂材料にアルミをラミネートした非通気性で熱溶着可能な材料からなっており、匂いや空気を通さないものである。この袋Hの内壁には、その開口部1から底側に向かってほぼ円筒形状の脱気パイプPが装着または挿入される。なお、前記脱気パイプPは、たとえば衛生的に密閉することが可能な樹脂製のストローからなり、脱気パイプPを袋H内に装着する場合には、たとえば接着剤や接着テープなどで固定すればよい。

【0013】前記脱気パイプPの前記底側に位置する一端は、フィルタ2に覆われた空気導入口3となっており、開口部1側に位置する他端は袋Hの外部に通じる空気排出口4となっている。また、脱気パイプPの中央部には、小さな孔5が複数設けられており、フィルタ6によって全ての孔5、5…が覆われている。なお、前記フィルタ2およびフィルタ6は、空気を通し、汚物を通さない構造となっている。

【0014】前記装置Dは、上部に開閉自在な蓋体7'を有する密閉可能なチャンバー7と、このチャンバー7内を排気して真空状態とするための排気手段8と、前記袋Hの開口部1付近を熱溶着する溶着手段9とを有している。

【0015】前記チャンバー7は、凹入部10と、この凹入部10の内側に設けられるヒータ部11とを有しており、前記ヒータ部11は、セラミックなどからなる電動式のヒータ12と、このヒータ12を上下移動させるための移動機構13と、前記ヒータ12の上方に設けられ、中央に隙間を有するカバー（図示せず）とからなる。なお、前記ヒータ12は、前記移動機構13によって保持されており、通電されることによって温度が上昇する構成となっている。

【0016】蓋体7'の下面には、平面視がほぼ長方形形状のシール部材15が設けられており、チャンバー7には、蓋体7'を閉じたときに、前記シール部材15と当接する位置に設けられたシール部材16が設けられている。そして、二つのシール部材15、16を当接させることで、チャンバー7は密閉されることになる。

【0017】前記排気手段8は、チャンバー7内に設けられた排気口17と、この排気口17にホース18を介して連通するポンプ19および吸気用モータ20とからなり、図示しない制御回路によって制御される前記吸気用モータ20を駆動することで、チャンバー7内の空気を吸気する構成となっている。

【0018】前記溶着手段9は、前記蓋体7'の下面に設けられた押圧部材21と、前記チャンバー7内に設けられたヒータ部11とからなる。なお、前記押圧部材21は、たとえば柔軟性および復元性を有する熱に強いス

ポンジからなる長尺の部材である。

【0019】次に、紙おむつSを真空バックする手順について図3を用いて説明する。まず、図3(A)に示すように、袋H内へ、紙おむつSおよび脱気パイプPをこの順に挿入し、図3(B)に示すような収納状態にする。なお、前記脱気パイプPが予め袋H内に装着されている場合には、袋H内へ紙おむつSのみを挿入する。また、脱気パイプPの空気排出口4の位置は、袋Hの開口部1よりも袋Hの外側へ突出していてもよいし、開口部1よりも袋Hの少し内側でもよく、さらに、開口部1とはほぼ同じ位置であってもよい。

【0020】そして、図3(C)に示すように、上記のような収納状態にある袋Hを、装置Dのチャンバー7内に挿入し、開口部1が前記溶着手段8の設けられている位置よりも奥側に位置するようにした状態で、蓋体7'を閉じ、シール部材15、16によって開口部1付近を密閉する。このとき、袋Hからチャンバー7への空気の通り道は、脱気パイプPのみとなる。以上の手順を踏まえば、装置Dのスイッチ（図示せず）をオンにする操作を行うだけで、紙おむつSを内部に収納した袋Hを真空バックすることができる状態とすることができる。

【0021】袋Hを上記の状態とした後、装置Dのスイッチをオンにすると、電源表示ランプ（図示せず）が点灯し、袋H内の空気の排出が始まる。このとき、排気手段8によってチャンバー7内の空気を排出することにより、チャンバー7内は負圧になり、前記蓋体7'を閉じる方向の力が加わるようになるため、特に前記装置Dの蓋体7'を閉鎖状態にロックするための手段を設けなくとも、蓋体7'が開くことはない。もちろん、そのようなロック手段を設けてもよい。

【0022】このように袋H内の排気が終われば、自動的に、溶着手段9によって袋Hの開口部1の溶着が開始される。すなわち、袋H内の所定の排気が終わるとともに、下に降りていたヒータ12が移動機構13によって上に持ち上げられ、袋Hの開口部1付近を脱気パイプPとともに溶着するように構成されている。なお、前記ヒータ12は電源をオンした時点から温められており、前記溶着がすぐに開始できるようになっている。また、上述の溶着が行われている間は、前記排出手段8による排気は続けられており、溶着の終了とともに、排気も自動的に終了するように制御されている。このため、紙おむつSを真空バックするために介護者などがすることは、使用後の紙おむつSを袋H内に入れ、袋Hを装置Dにセットするだけでよい。上述のように溶着および排気が終了すると、点灯していた電源表示ランプが消え、使用者に袋Hの真空バック処理が終了したことを知らせる構成となっている。

【0023】なお、上記の装置Dの操作において、溶着が終了したときに、前記ヒータ12の昇温が、停止されるようにしてもよいし、持続されるようにしてもよく、

また、停止するか持続するかを選択できるようにしてもよい。

【0024】以上の操作を行って、袋H内の空気を脱気し袋Hを真空パックすることにより、図3(D)に示すように、紙おむつSを小さく圧縮することができ、紙おむつSの嵩張りをなくした状態で廃棄することが可能となる。また、袋Hからの異臭や菌の発生を防止することも可能となる。

【0025】また、脱気パイプPの空気導入口3に設けられたフィルタ2および中央部に設けられたフィルタ6により、紙おむつSの汚物が装置D内に吸い込まれることがなく、装置D内は常に清潔かつ衛生的である。しかも、脱気パイプPに汚物が付着しても、紙おむつSと脱気パイプPとが一体になった状態で廃棄することができ、袋Hの扱いに際しても、常に清潔かつ衛生的に行うことができる。

【0026】さらに、前記脱気パイプPには、複数の孔5、5…が設けられていることから、袋Hの脱気の際に、脱気パイプPが紙おむつSを吸着し、紙おむつSによって前記孔5が数カ所詰まったとしても、他の孔5から袋H内の空気を排出することができ、常にスムーズな真空処理を行うことが可能である。

【0027】図4は、前記袋Hおよび脱気パイプPの変形例を概略的に示すための斜視図である。22は、前記フィルタ6と同一材料からなる平面視がほぼ長方形のフィルタであり、袋Hの内壁にその三辺が接着剤などにより（あるいは熱溶着などでもよい）固着され、フィルタ22と袋Hとによって、空間23が形成されている。そして、この空間23には、フィルタ22の開口部1に近い辺に設けられた開口部22'から、前記脱気パイプPを挿入可能となっている。なお、フィルタ22を有する袋Hに挿入する脱気パイプPは、前記フィルタ2および6を有さないものとしてもよい。

【0028】上記の構成からなるフィルタ22を有する袋Hを用いれば、脱気パイプPを袋Hに簡単に装着することが可能となる。

【0029】袋Hを、図3、4に示すように、その両端が内側に折り入れられた形状とした場合には、袋Hの開口部1を広げるという作業が簡単になり、ひいては使用後の紙おむつSを袋Hに入れる作業が簡単になる。

【0030】図5(A)および(B)は、前記脱気パイプPの他の変形例を概略的に示すための斜視図および縦断面図である。図5に示す脱気パイプPの構成および効果は、図2に示した脱気パイプPのものと同じであるが、相違点は、前記フィルタ6が全体に渡って脱気パイプPの外周に接着されるのではなく、両端に貼りしろ6'、6'が形成されており、貼りしろ6'、6'を接着または熱溶着することによって、フィルタ6が脱気パイプPに固定され、さらに、脱気パイプPの袋Hへの装着は、前記貼りしろ6'を袋Hに対して接着または

熱溶着することによって行われる点である。このように、貼りしろ6'を利用することにより、脱気パイプPに対するフィルタ6の固定と、袋Hに対する脱気パイプPの固定を簡単に行うことができる。

【0031】図6および図7は、本発明の第二実施例に係る紙おむつの真空パック方法を実施するための袋Hと装置D₂の構成を概略的に示す斜視図および要部拡大縦断面図である。なお、上記第一実施例に示したものと同一構造の部材には、同じ符号を付し、その説明を省略する。第二実施例の紙おむつの真空パック方法を実施するための袋Hと装置D₂の構成および効果は、上記第一実施例のものとはほとんど同じであるが、相違点は、装置D₂が、紙おむつSを収納した袋Hを保管するための保管部24をチャンバー7の下方に有する装置D₂となっている点である。

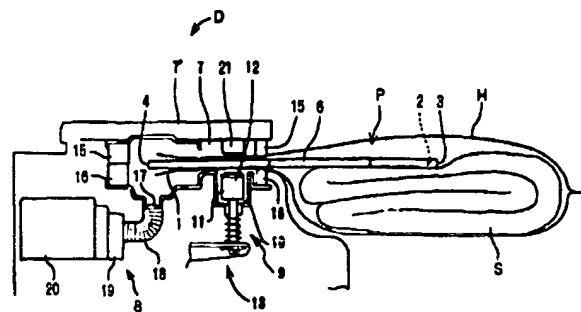
【0032】装置D₂は保管部24を内部に有することから、複数の使用済の紙おむつS、S…を袋H内に溜めた状態で保管部24内に保管し、所定分量の紙おむつSを内部に収納させてから袋Hを真空パックすることができるため、複数の紙おむつS、S…を一度に真空パック処理することが可能となり、コストを下げることができる。また、紙おむつSを真空パック処理しない状態で袋H内に保管していると、匂いなどが外部に漏れる恐れがあるが、前記保管部24の前部に設けた開閉自在の蓋25とこの蓋25の周辺部25'とで袋Hの開口部1を挟持した状態で、袋Hを保管部24内に保管すれば、袋Hに収納された使用済の紙おむつSからの匂いなどが外部へ漏れることを防止することができる。

【0033】なお、装置D₂における溶着手段8は、前記チャンバー7の外部に設けられている。また、14は、中央に隙間14'を有するカバーであり、26は、上記第一実施例において説明したスイッチ、27は、電源表示ランプである。

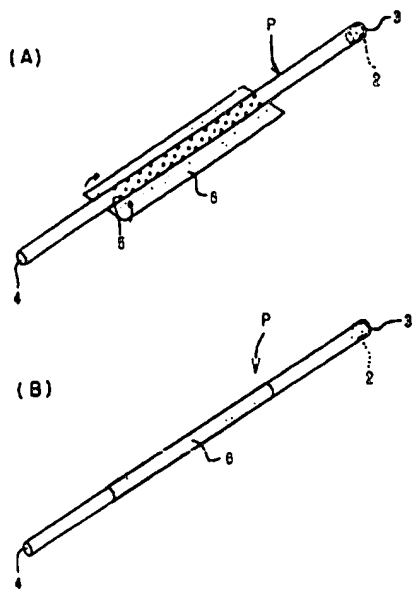
【0034】また、上記第一実施例において、袋Hの開口部1を使用可能に閉じることができるような止め部材（図示せず）によって袋Hを閉じるようにすれば、上記装置D₂と同様の効果を得ることができる。

【0035】上記の構成からなる装置DおよびD₂では、中央に隙間14'を有するカバー14を設けてあることから、隙間14'に袋Hを当接させることで、隙間14'の下方にあるヒータ12によって袋Hを溶着することができるとともに、その隙間14'を適宜の大きさとし、使用者の指などが隙間14'から入らないように形成されている。また、ヒータ12は、溶着手段8による袋Hの溶着時のみ隙間14'付近に移動し、前記溶着時以外は隙間14'の下方に位置するように構成されている。上記のような構成にしたことから、使用者がヒータ12に触れることを確実に防止することができ、使用者は安全に装置DおよびD₂を使用することができる。

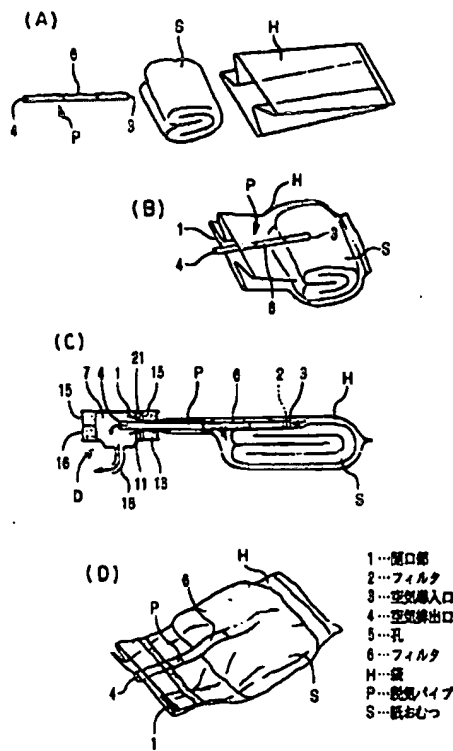
【0036】また、上記の構成からなる装置DおよびD



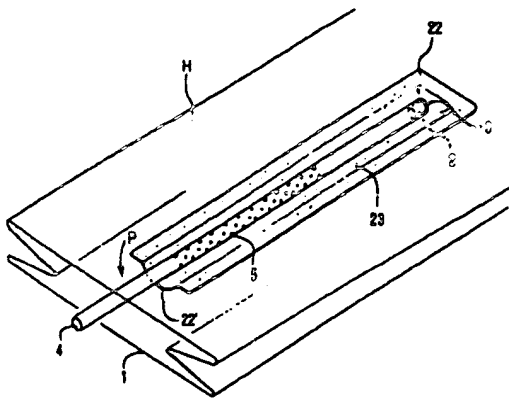
【図2】



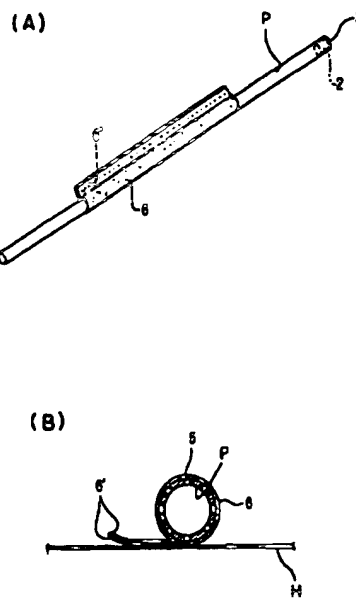
【図3】



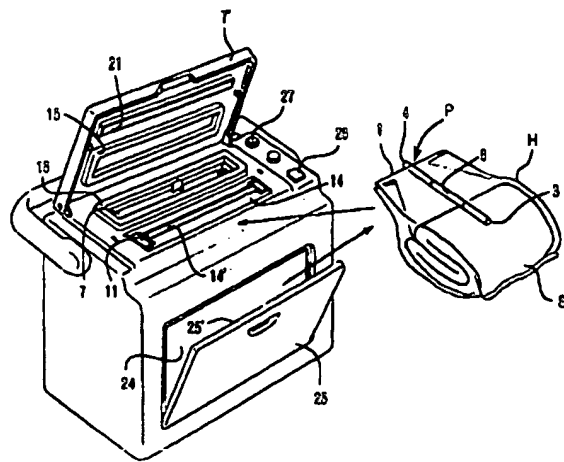
【図4】



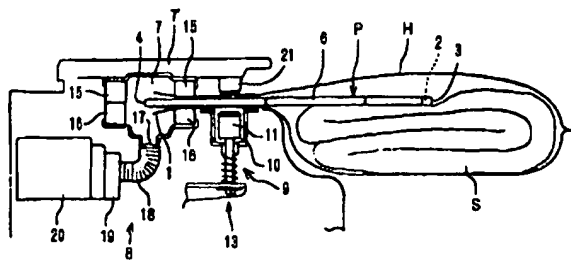
【図5】



【图6】



【图7】



JP 2001-114,214 A

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013894370 **Image available**

WPI Acc No: 2001-378583/ 200140

Vacuum packing method for paper nappy, Involves sucking out air from interior of bag through inserted dessicant pipe with filter covering the holes in central portion and filter at the inner end

Patent Assignee: SANRORU KK (SANR-N)

Number of Countries: 001 Number of Patents: 001

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|-----------|------|------|-------------|------|------|------|
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| JP 2001114214 | A | 20010424 | JP 99288733 | A | 19991008 | 200140 B |
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Priority Applications (No Type Date): JP 99288733 A 19991008

Patent Details:

| Patent No | Kind | Lan | Pg | Main IPC | Filing Notes |
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| JP 2001114214 | A | | 7 | B65B-031/04 | |
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Abstract (Basic): JP 2001114214 A

NOVELTY - The method involves sucking out air through dessicant pipe (P) being inserted through the opening of bag. The dessicant pipe has filter at central portion that covers the holes provided and at the inlet which is at the inner side of the bag. The opening of the bag which holds the pipe, is sealed.

USE - For paper nappy used by infants, sick people, physically handicapped, aged and incontinence persons.

ADVANTAGE - Amount of refuse collection is decreased as bulkiness of nappy is reduced. Nasty smell from refuse and generation of bacterium are prevented and hence cleanliness and hygiene are improved. Is hygienic and is easily nursed with less responsibility of patients assistance person. Environmental pollution is decreased by the hygiene property.

DESCRIPTION OF DRAWING(S) - The figure shows the longitudinal cross-sectional view, isometric view before and after storing paper nappy. (Drawing includes non-English language text).

Dessicant pipe (P)

pp; 7 DwgNo 3/7

Derwent Class: Q31; Q35

International Patent Class (Main): B65B-031/04

International Patent Class (Additional): B65F-001/10

(19) Japanese Patent Office (JP)

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F term (for ref.): 3E023 BA04 BA11

3E053 AA06 BA09 CA01 CA06 CB02

FA01 JA10

(54) [Title of the Invention] PAPER DIAPER VACUUM PACKING METHOD

(57) [Abstract]

[Problem to be Solved] To provide a paper diaper vacuum packing method which is clean and hygienic easing the burden of a caretaker and which can alleviate the problems of an aging society and environmental pollution by reducing the bulkiness of diapers thereby decreasing the number of garbage bags and the volume of garbage being collected and preventing unpleasant smell and generation of bacteria from the garbage bags, which are kept at home or stored in a garbage collection station.

[Means to Solve the Problem] This relates to a method for vacuum packing paper diaper S wherein used paper diaper S is stored in bag H made of a nonporous material, the air of said bag H is evacuated so that the inside of said bag H forms a vacuum state, and said vacuumed bag H is sealed off. According to this method, a nearly cylindrical shape of deaerating pipe P is mounted on or inserted in the area of opening 1 of said bag H towards the center of said bag H into the inside of said bag H, with the one end of said deaerating pipe P being air inlet 3 covered with filter 2 and the other end being air outlet 4 leading to the outside of said bag H. Hole 5 covered with filter 6 is created at the center of said deaerating pipe P. The outlet of the air inside said bag H is made through said deaerating

pipe P. The area of opening 1 of said bag H, from which the air is evacuated, is welded to said deaerating pipe P.

1 ... opening

2 ... filter

3 ... air inlet

4 ... air outlet

5 ... hole

6 ... filter

H ... bag

P ... deaerating pipe

S ... paper diaper

[What is Claimed is]

[Claim 1]

A method for vacuum packing paper diapers wherein;
used paper diapers are stored in a bag made of a nonporous material, the air of said bag is evacuated so that the inside of said bag forms a vacuum state, and said vacuumed bag is sealed off, characterized in that a nearly cylindrical shape of deaerating pipe is mounted on or inserted from the area of the opening of said bag towards the center of said bag into the inside of said bag, with the one end of said deaerating pipe being an air inlet covered with a filter and the other end being an air outlet leading to the outside of said bag, a hole covered with a filter is created on the center of said deaerating pipe, the outlet of the air inside said bag is made through said deaerating pipe, and the area of the opening of said bag, wherein the air is evacuated, is welded to said deaerating pipe.

[Claim 2]

The method for vacuum packing paper diapers, as set forth in claim 1, characterized in that said bag is vacuum packed by a device comprising:

a chamber capable of sealing off;

a method for evacuating the air inside said chamber; and

a method for welding the area of the opening of said bag by applying heat.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The present invention relates to a method for vacuum packing paper diapers wherein used paper diapers are vacuum packed.

[0002]

[Description of the Prior Art]

For example, conventionally, paper diapers after being used at home or in hospitals by infants, physically-disabled people, adults or elderly people who need assistance due to sickness or accidents are discarded directly into garbage bags. Thick absorber material which absorbs waste material is built in these paper diapers, and furthermore, the volume of the used paper diaper usually expands about two times that of the paper diaper before use.

[0003]

Moreover, garbage collection day is usually regulated as about twice a week and the amount of paper diapers accumulated before the garbage collection day (3 to 5 days) is 20 bags or

more in the case of an adult and elderly person since each person changes his/her paper diaper 5 - 6 times a day. This is equivalent to 2.5 garbage bags.

[0004]

Furthermore, if a garbage bag containing paper diapers is kept at home until the garbage collection day, an unpleasant odor or bacteria can be easily generated from the garbage bag. In reality, caretakers worry themselves about the storage place of the garbage bag where paper diapers are stored. Especially, since the government encourages home-nursing care, the disposal of paper diapers at home will be a significant issue in the future.

[0005]

[Problem to be Solved by the Invention]

As described above, since the aforementioned paper diaper has a thick absorbing material and the thickness of the used paper diaper expands about two times that of the diaper before use and especially, in the case of an adult and elderly person, the amount of paper diapers used per day is large, it is necessary to have a wide space for storing the used paper diapers which are accumulated by garbage collection day. Furthermore, as the amount of the used paper diapers becomes larger, the number of the garbage bags becomes greater thereby

increasing the volume of the garbage being collected.

[0006]

Moreover, if a garbage bag containing paper diapers is stored at home until the garbage is collected and the garbage bag is left in the garbage collection station, an unpleasant odor and bacteria can be easily generated from the garbage bag and the situation becomes unclean and unsanitary. Therefore, the disposal of used paper diapers is a significant issue for those who are engaged in home-nursing care and is a new challenge for an aging society and for environmental pollution.

[0007]

The present invention is created with attention to the above described matter and the objective of the present invention is to provide a paper diaper vacuum packing method which is clean and hygienic, easing the burden of a caretaker, and can alleviate the problems of an aging society and environmental pollution by reducing the bulkiness of diapers, thereby decreasing the number of garbage bags and the volume of garbage being collected and preventing the unpleasant odor and generation of bacteria from the garbage bags, which are kept at home or stored in a garbage collection station.

[0008]

[Means to Solve the Problem]

In order to achieve the above described objective, in the paper diaper vacuum packing method of the present invention, used paper diapers are stored in a bag made of a nonporous material, the air of said bag is evacuated so that the inside of said bag forms a vacuum state, and said vacuumed bag is sealed . A nearly cylindrical shape of deaerating pipe is mounted on or inserted from the area of the opening of said bag towards the center of said bag into the inside of said bag, with one end of said deaerating pipe being an air inlet covered with a filter and the other end being an air outlet leading to the outside of said bag. A hole covered with a filter is created on the center of said deaerating pipe. The outlet of the air inside said bag is made through said deaerating pipe, and the area of the opening of said bag, wherein the air is evacuated, is welded to said deaerating pipe (claim 1).

[0009]

Furthermore, said bag may be vacuum packed by a device comprising a chamber capable of sealing off, a method for evacuating the air inside said chamber and a method for welding the area of the opening of said bag by applying heat (claim 2).

[0010]

With the above described structure, it is possible to provide a paper diaper vacuum packing method which is clean and

hygienic, easing the burden of a caretaker and alleviating the problems of an aging society and environmental pollution by reducing the bulkiness of diapers, thereby decreasing the number of garbage bags and the volume of garbage being collected and preventing the unpleasant odor and generation of bacteria from the garbage bags, which are kept at home or stored in a garbage collection station.

[0011]

[Embodiments of the Invention]

Embodiments of the present invention will be described below by referring to drawings. Figures 1 and 2 are the cross-sectional view and the enlarged perspective view of substantial parts, which schematically illustrates the structures of bag H and device D with which the paper diaper vacuum packing method of the embodiment 1 of the present invention is implemented. The paper diaper vacuum packing method of the present invention is a method for hygienically sealing off and disposing by using a novel nozzle (straw) suction method. More particularly, this method is used for storing used paper diaper S in bag H and vacuum packing bag H by device D.

[0012]

The aforementioned bag H is made of nonporous material capable of being welded by applying heat, which is, for example,

made by laminating aluminum on a thin resin material, and blocks odor or air. A nearly cylindrical shape of deaerating pipe P is mounted on or inserted from opening 1 of bag H towards the bottom of the bag into the inner wall of the bag. Here, the aforementioned deaerating pipe P is, for example, made of resin straw capable of hygienically sealing off. In the case where deaerating pipe P is mounted on the inside of bag H, it may be fixed with, for example, adhesive agents or adhesive tapes.

[0013]

One end of the aforementioned deaerating pipe P which is located in the bottom of the aforementioned bag H is air inlet 3 covered with filter 2 and the other end which is located in opening 1 is air outlet 4 which leads to the outside of bag H. Also, a plurality of small holes 5 are placed in the center of deaerating pipe P and all of holes 5 are covered with filter 6. Here, the aforementioned filters 2 and 6 have structures which can let air through, but block waste matter.

[0014]

The aforementioned device D comprises chamber 7 capable of sealing off, which has lid 7' in the upper part, which is capable of opening and closing; air evacuation means 8 for evacuating the air from chamber 7 so that the inside of chamber

7 becomes a vacuum; and welding means 9 for welding the area of opening 1 of the aforementioned bag H by applying heat.

[0015]

The aforementioned chamber 7 comprises concave part 10 and heater part 11 mounted on the inside of concave part 10. The aforementioned heater part 11 comprises electrically operated heater 12, made of materials such as ceramics, with a moving mechanism 13 for vertically moving heater 12 and a cover (not shown in the figure) mounted on the upper side of the aforementioned heater 12 having a gap at the center. Here, the aforementioned heater 12 is supported by the aforementioned moving mechanism 13 having the structure wherein the temperature goes up when the electricity is turned on.

[0016]

Seal member 15, which is nearly rectangular in shape, in a plan view, is mounted on the bottom surface of lid 7'. Chamber 7 has seal member 16 which is mounted in the place where the aforementioned seal member 15 meets seal member 16 when lid 7' is closed. Chamber 7 is sealed off by putting together two seal members 15 and 16.

[0017]

The aforementioned air evacuation means 8 comprises air outlet 17 mounted on the inside of chamber 7, pump 19 which is

communicated with air outlet 17 through hose 18 and air suction motor 20. By driving the aforementioned air suction motor 20 controlled by a control circuit which is not shown in the figure, the air from the inside of chamber 7 is suctioned.

[0018]

The aforementioned welding means 9 comprises pressing member 21 mounted on the bottom surface of the aforementioned lid 7' and heater part 11 mounted on the inside of the aforementioned chamber 7. Here, the aforementioned pressing member 21 is a long member made of materials which have flexibility, resilience and heat-resistance such as a sponge.

[0019]

Next, the procedure for vacuum packing paper diaper S will be described by using Figure 3. First, as shown in Figure 3(A), paper diaper S and deaerating pipe P are inserted in this order into bag H so that they are stored in a state shown in Figure 3(B). Here, in the case that the aforementioned deaerating pipe P is placed in advance in the inside of bag H, only paper diaper S is inserted into bag H. Also, air outlet 4 of deaerating pipe P may be located projecting outward from opening part 1 of bag H or in the inside of bag H slightly inward from opening part 1 or in nearly the same place as opening part 1.

[0020]

Then, as shown in Figure 3(C), bag H in the above described storage state is inserted into chamber 7 of device D so that opening part 1 is located in the back from the place where the aforementioned welding means 9 is mounted. In this state, lid 7' is closed and the area of opening part 1 is sealed off by seal members 15 and 16. Here, the sole air passage from bag H to chamber 7 is deaerating pipe P. If the above described procedure is followed, by turning on a switch (not shown in the figure) of device D, it is possible to create a state wherein bag H containing paper diaper S can be vacuum packed.

[0021]

After bag H is put in the above described state and the switch of device D is turned on, a source pilot lamp (not shown in the figure) blinks and the air inside of bag H starts to evacuate. Here, by evacuating the air inside of chamber 7 by air evacuation means 8, the inside of chamber 7 comes under negative pressure and a force to close the aforementioned lid 7' is added. Therefore, lid 7' of device D does not open without creating a means for locking lid 7' in a state of complete closure. Obviously, creating such a locking means may be possible.

[0022]

In this way, after the evacuation of the air inside of bag H is finished, opening part 1 of bag H automatically starts being welded by welding means 9. That is, with the end of a predetermined air evacuation of bag H, heater 12 which has been in a downward position is elevated by moving mechanism 13 to weld the area of opening part 1 of bag H together with deaerating pipe P. Here, the aforementioned heater 12 has been heated since the electricity is turned on so that the above described welding process can be started immediately. Furthermore, while the above described welding is occurring, the air evacuation by the aforementioned air evacuation means 8 is continued and with the end of the aforementioned welding, the air evacuation is controlled to finish automatically. Therefore, in order to vacuum pack paper diaper S, caretakers just have to put the used paper diaper S into bag H and set up bag H in device D. As described above, after the welding and air evacuation processes finish, the lighted source pilot lamp is turned off thereby informing the users of the end of the vacuum packing process of bag H.

[0023]

Here, in the operation of the aforementioned device D, when the welding process finishes, the temperature rise of the

aforementioned heater 12 may be set to stop or continue.

Alternatively, one can choose whether it stops or continues.

[0024]

By conducting the above described operation wherein the air inside of bag H is evacuated so that bag H is vacuum packed, as shown in Figure 3(D), it is possible to compress paper diaper S and dispose bag H without the bulkiness of paper diaper S. Furthermore, it is possible to prevent the generation of unpleasant odor and bacteria from bag H.

[0025]

Moreover, because of filter 2 mounted on air inlet 3 of deaerating pipe P and filter 6 mounted on the center part, the waste matter in paper diaper S are not absorbed into device D and the inside of device D is always clean and hygienic. In addition, even if filthy matters are deposited in deaerating pipe P, it is possible to dispose bag H in a state where paper diaper S is integrated with deaerating pipe P. Therefore, bag H can be always disposed cleanly and hygienically.

[0026]

Furthermore, a plurality of holes 5 is mounted on the aforementioned deaerating pipe P. Therefore, when the air is evacuated from bag H, deaerating pipe P absorbs paper diaper S. Even if some of the aforementioned holes 5 are blocked up by

paper diaper S, the air can be evacuated from bag H through other holes 5. Therefore, it is possible to always conduct a smooth vacuum processing.

[0027]

Figure 4 is a perspective view schematically illustrating an example of changed forms of the aforementioned bag H and deaerating pipe P. 22 is a filter made of the same material as the aforementioned filter 6, which is shaped in a near rectangle in a plan view. Three sides of filter 22 are fixed to the inner wall of bag H with adhesive agents (or they may be welded by applying heat) and space 23 is created by filter 22 and bag H. The aforementioned deaerating pipe P can be inserted into space 23 through opening part 22' placed around opening part 1 of filter 22. Here, deaerating pipe P which is inserted into bag H having filter 22 may not have the aforementioned filters 2 and 6.

[0028]

By using bag H which has filter 22 having the above described structure, deaerating pipe P can be easily installed in bag H.

[0029]

As shown in Figures 3 and 4, when bag H is made in a shape wherein both sides of bag H are folded in, it is easy to spread

out opening part 1 of bag H, and consequently, it is easy to put used paper diaper S into bag H.

[0030]

Figures 5(A) and (B) are the perspective view and the cross-sectional view schematically illustrating another example of changed forms of the aforementioned deaerating pipe P. The structure and effect of deaerating pipe P of Figure 5 are almost the same as those of deaerating pipe P of Figure 2. The difference is that the aforementioned filter 6 is not attached to the entire outer circumference of deaerating pipe P, but overlap widths 6' are created in both sides of filter 6. With overlap widths 6' being attached or welded by applying heat, filter 6 is fixed to deaerating pipe P, and furthermore, filter 6 is put in bag H of deaerating pipe P by attaching the aforementioned overlap widths 6' to bag H or welding it by applying a heat. In this way, by using overlap widths 6', filter 6 can be easily fixed to deaerating pipe P and deaerating pipe P can be easily fixed to bag H.

[0031]

Figures 6 and 7 are the perspective view and the enlarged cross-sectional view of substantial parts schematically illustrating the structures of bag H and device D₂ for implementing the paper diaper vacuum packing method of

embodiment 2 of the present invention. Here, parts and members having the same structures as those of the above described embodiment 1 have the same codes thereby omitting their descriptions. The structures and effects of bag H and device D₂ for implementing the paper diaper vacuum packing method of embodiment 2 are almost the same as those of embodiment 1. The different points are that device D becomes device D₂ in embodiment 2, wherein storage part 24 for storing bag H containing paper diaper S is created beneath chamber 7.

[0032]

Since device D₂ has storage part 24 inside, it is possible to store bag H containing a plurality of used paper diapers S in storage part 24 and vacuum pack paper diapers S after storing a predetermined amount of paper diapers S inside. Therefore, it is possible to vacuum pack a plurality of paper diapers S at once, thereby bringing down the cost. Also, if paper diaper S is stored in bag H without being vacuum packed, smell and the like might leak to the outsides. If bag H is stored in the aforementioned storage part 24 by supporting opening part 1 of bag H together with lid 25 capable of opening and closing, which is mounted on the anterior part of storage part 24, and area 25' of lid 25, it is possible to prevent smell from used paper

diapers S, which are stored in bag H, from leaking to the outside.

[0033]

Here, welding means 8 of device D_2 is mounted on the outside of the aforementioned chamber 7. Also, 14 is a cover having gap 14' in the center, 26 is a switch which is described in the aforementioned embodiment 1 and 27 is a source pilot lamp.

[0034]

In addition, in the aforementioned embodiment 1, if bag H is closed by a stopper (not shown in the figure) with which opening part 1 of bag H can be closed and sealed off, device D can obtain the same effect as the aforementioned device D_2 .

[0035]

Since devices D and D_2 , comprising the aforementioned structure, have cover 14 having gap 14' in the center, by putting bag H together with gap 14', bag H can be welded by heater 12 which is placed beneath gap 14'. At the same time, gap 14' is made to proper size so that fingers of a user do not get in from gap 14'. Furthermore, heater 12 moves to the vicinity of gap 14' only when bag H is welded by welding means 8. At other time heater 12 is kept beneath gap 14'. Because of the above described structure, it is possible to most surely

prevent the user from touching heater 12 and he or she can safely use device D or device D₂.

[0036]

Moreover, in devices D and D₂ comprising the above described structure, heater 12 starts to be heated when the electricity is turned on and the temperature of heater 12 becomes sufficiently high when the air evacuation of bag H finishes. In this way, since the temperature of heater 12 is set in terms of time, it is possible to smoothly conduct the vacuum packing process of bag H without any time loss. Here, the temperature setting of the time when the temperature of the aforementioned heater 12 is going up may be changed accordingly, depending on the types of material used for making bag H.

[0037]

Furthermore, in devices D and D₂ comprising the above described structure, since heater 12 is electrically operated, the maintenance becomes easy, thereby bringing down the cost.

[0038]

The structure of the aforementioned devices D and D₂ are not limited to the above described one. If the air inside of bag H can be suctioned through the aforementioned deaerating pipe P, the structure of devices D and D₂ does not have to be the chamber system. For example, the air may be evacuated from bag H through

deaerating pipe P by using a tube. Furthermore, devices D and D₂ may have a structure wherein, by putting pressure from the circumference of bag H, the air is evacuated only through deaerating pipe P. Also, they may have a structure wherein, packing of bag H may be replaced with welding by heater 12 and opening part 1 of bag H can be tied with a string and the like, or opening part 1 of bag H is directly tied.

[0039]

In the above described two embodiments, for example, deoxidizer can be enclosed in bag H.

[0040]

In the above described two embodiments, if deaerating pipe P is made with, for example, commercially-available resin straw, the cost can be reduced.

[0041]

According to the paper diaper vacuum packing method having the above described structure, it is possible to dispose the aforementioned bag H in a vacuum packed state. Therefore, unpleasant odor does not leak from bag H preventing dogs and cats from detecting the smell and tearing up bag H and it is hygienic. Furthermore, people engaged in waste material collection suffer from problems of smells and infections of diseases caused by disposal of used paper diapers, but according

to the paper diaper vacuum packing method of the present invention, it is possible to solve these hygiene problems.

[0042]

[Effects of the Invention]

According to the present invention having the above described structure, it is possible to provide a paper diaper vacuum packing method which is clean and hygienic, easing the burden of a caretaker and can alleviate the problems of an aging society and environmental pollution by reducing the bulkiness of diapers thereby decreasing the number of garbage bags and the volume of garbage being collected and preventing unpleasant odor and generation of bacteria from the garbage bags, which are kept at home or stored in a garbage collection station.

[Brief Description of the Drawings]

[Figure 1]

Figure 1 is a cross-sectional view schematically illustrating the structures of the bag and device for implementing the paper diaper vacuum packing method of embodiment 1 of the present invention.

[Figure 2]

(A) and (B) are perspective views schematically illustrating the deaerating pipes of the aforementioned

embodiment, one showing the pipe before the filter is placed in the pipe and the other, after the filter is placed in the pipe.

[Figure 3]

(A) and (B) are perspective views schematically illustrating the state of the bag before and after the paper diaper is stored according to the above described embodiment. (C) is a cross-sectional view schematically illustrating the state of the bag wherein the air is evacuated from the bag containing the paper diaper by the device. (D) is a perspective view schematically illustrating the structure of the bag after the air is evacuated.

[Figure 4]

Figure 4 is a perspective view schematically illustrating the structure of an example of changed forms of the bag and the deaerating pipe of the above described embodiment.

[Figure 5]

(A) and (B) are a perspective view and a cross-sectional view, schematically illustrating another example of changed forms of deaerating pipe P of the above described embodiment.

[Figure 6]

Figure 6 is a perspective view schematically illustrating the structures of the bag and the device for implementing the

paper diaper vacuum packing method of embodiment 2 of the present invention.

[Figure 7]

Figure 7 is a cross-sectional view schematically illustrating the structures of the bag and the device of the above described embodiment.

[Explanation of the Codes]

1 ... opening part

2 ... filter

3 ... air inlet

4 ... air outlet

5 ... hole

6 ... filter

H ... bag

P ... deaerating pipe

S ... paper diaper

[Figure 1]

[Figure 2]

[Figure 3]

1 ... opening part

2 ... filter
3 ... air inlet
4 ... air outlet
5 ... hole
6 ... filter
H ... bag
P ... deaerating pipe
S ... paper diaper

[Figure 4]

[Figure 5]

[Figure 6]

[Figure 7]